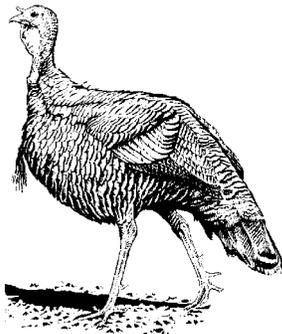


Pennsylvania Game Commission

Spring Wild Turkey Hunting Options for Increasing Recreational Opportunity

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Executive Summary

Since our first report in 2003 regarding spring turkey hunting options, several changes have been made to spring turkey seasons which increased opportunities: a one-day statewide youth-only hunt the Saturday prior to the regular season opening (began 2004); special turkey license, the purchase of which permits harvesting a second spring turkey (began 2006); Mentored Youth Hunt, which includes spring turkey season (began 2006); and season length extended one day to Memorial Day (began 2008). Additional opportunities exist and an update of the original report is warranted to adequately address biological considerations of each option. This paper provides that information as well as a summary of the outcome to date of the above four opportunities.

Increasing turkey hunting opportunities during the spring season is more desirable than doing so for fall because of the potential to negatively impact the population from expanding the either-sex fall turkey hunting season. We already increase/decrease fall season lengths depending on turkey population trends. On the contrary, the spring season opens after breeding has occurred and hen turkeys alone incubate the eggs and raise the broods thereby harvesting males poses minimal impact to the population. Additionally, there has been increased interest in spring hunting among Pennsylvania hunters during the last 10 years. Part of the hunting heritage/hunter safety objective of the agency's turkey management plan includes promoting and improving turkey hunting opportunities for all turkey hunters. However, some caution is warranted because research from Kentucky suggests that increasing adult gobbler harvest rates beyond 50 percent can change the age structure, with less older gobblers in the population, which will decrease hunter satisfaction. Harvest rates in Pennsylvania (from preliminary analyses) average 22 percent for first year gobblers (jakes) and 38 percent for adult gobblers. Final analyses of gobbler harvest rates from our 4-year study (2006-2009) will be completed this winter. These preliminary estimates show we can offer an additional spring hunting opportunity at this time, although a conservative approach is advisable, adapting it accordingly in the future. This paper provides the biological implications of an array of spring hunting options for an informed decision-making process.

Six options for expanding spring hunting opportunities for Keystone State hunters are: 1) change season dates; 2) extend hunting hours beyond the noon closure; 3) allow each hunter, with the purchase of the general hunting license, to choose between taking one bird in the fall and one in the spring, or two birds in the spring and none in the fall; 4) increase the bag limit during the spring; 5) regulate turkey hunter numbers; and 6) Sunday turkey hunting. A summary of these options is provided in Table 1. The authors propose implementing one option at a time so the effects of any change in regulations can be properly evaluated (for at least 3 years).

Changes in season dates are possible by incorporating an earlier opening date, lengthening the season by adding days at the end of the season, opening the season on a weekday or having separate opening dates in different areas of the state. The "Management Plan for Wild Turkeys in Pennsylvania, 2006-2015" (pages 21-23) recommends against opening the season earlier because of the potential for additional breeding and nesting disturbance and illegal hen harvest. Adding days to the end of the season provides greater recreational opportunity without jeopardizing nesting success or hen survival. A modest increase in the gobbler harvest (1 – 3 percent,

depending on number of days) would result. Opening the season on a weekday might reduce hunting pressure on the first day, but would not provide additional opportunity unless the season opened earlier, which is not advisable. Establishing a split opening for the spring season is an option that some hunters have proposed. Nesting data from a recent study in the south-central region does not support the theory that there is a significant difference in the timing of nesting in various parts of the state. There are administrative and law enforcement concerns associated with having split opening dates, and increased hunting pressure in the areas that open earlier might cause declines in hunter satisfaction.

A second option is to extend hunting hours to late afternoon or sunset. This could be done for the entire season or for the second half of the season. Compared to the other options, this option would provide the most increase in hunting opportunity for hunters. There are, however, biological and social concerns. Longer hunting hours would increase disturbance of hens and result in some nest abandonment, but the impact probably would be local and is unlikely to affect the statewide recruitment rate. However, gobbler harvest rate could increase by 10 percent. Increasing hunting hours during the last two weeks of the season (as in Virginia) would provide similar hunting benefits with less potential for substantially increasing nest disturbance and gobbler harvest. This option would *increase* hunting opportunity for all hunters, give youth and those adults who work in the morning more time to hunt, and might decrease hunter interference and increase safety. Social, non-biological concerns from afternoon hunting include increased violations including road hunting, trespass and potential for an increase in hunting-related shooting incidents resulting from illegal firearm use and flock shooting.

A third option is the choice between taking one turkey in the fall and one in the spring, or taking two birds in the spring and none in the fall, on the general hunting license. The harvest of any additional spring birds could be allowed at any time during the season or restricted to the latter half of the season. This option is not as beneficial for the agency as in the past because of the special spring license, which allows hunters the opportunity to harvest a second bearded turkey during the spring season, with the purchase of the special license. This option provides more spring hunting opportunity only to hunters who were unsuccessful or chose not to harvest a turkey the previous fall. Spring hunting pressure and the spring harvest would increase, but the decrease in fall harvest would offset this. The spring bag limit would increase to three without increasing the annual bag limit and would be expected to have minimal impact on the gobbler harvest rate.

Most states allow multiple birds to be taken in the spring. The fourth option is increasing the spring season bag limit to two birds (with the general hunting license) while maintaining the sale of the special spring license and the current fall limit. The harvest of any additional spring birds could be allowed at any time during the season or restricted to the latter half of the season. This option has more potential to impact turkey populations because of the increase in the annual bag limit. Increased hunting pressure might negatively impact hen survival, amplify nest disturbance and decrease the number of older gobblers available for subsequent years because gobbler harvest rates could reach 50 percent, which is not advisable. Impacts would be lessened if the additional harvests were restricted to the second half of the season or to only private property, which also would lessen the impact on turkey populations on public land. Requiring hunters to

purchase additional tags at an issuing agent or regional office after reporting their previous bird might improve reporting rates and allow for better collection of biological data.

Some states and provinces regulate hunter numbers to reduce the potential for interference, decrease hunting pressure and reduce disturbance and illegal taking of hens. This option could be used in combination with other options, but is unlikely to be popular with hunters.

The final option is Sunday hunting, which would require legislative action, but provide five additional hunting days to all licensed hunters.

The authors recommend the choices of establishing Sunday hunting in the spring if legislative action grants this authority to the Game Commission, extending hunting hours during the second half of the spring season, a third-bird spring bag limit during the second half of the season, or allowing a two-bird spring bag limit on the general license if the hunter forgoes a fall turkey. These options have low potential for adverse biological impacts (See Table 1). Support for any of these options currently is not widespread, according to the 2008 Pennsylvania Turkey Hunter Survey. Hunters tend to be conservative in approaching changes in seasons and bag limits. Therefore it is recommended that an educational outreach program be developed to inform hunters of the benefits and impacts of any change.

Introduction

In accordance with the Management Plan for Wild Turkeys in Pennsylvania, 2006-2015, the hunting heritage and hunter safety objective specifies that we annually consider implementation of expanded spring hunting opportunities, as well as expanding youth turkey hunting opportunities. Expansion of the spring season is more desirable than the fall for several reasons. First, in 2010 we began a 4-year research study to assess fall hen harvest rates and impacts of varying fall season length on harvest rates, so changing fall season framework beyond what is called for in the study would be counterproductive. Secondly, studies in other states have indicated that when fall harvests approach or exceed spring harvest levels population growth occurs more slowly or declines. Only since 2001 have the statewide spring harvests exceeded that of fall, but in some of Pennsylvania's 22 Wildlife Management Units (WMUs) fall harvests continue to exceed the spring harvests. Thirdly, increasing the either-sex fall harvest has more potential to negatively impact the turkey population than the spring season because of the possibility of removing too many females from the population. Overharvest of hens can impact population growth by decreasing the spring breeding population the following year. Conversely, the spring gobbler season begins after the peak of breeding in most years. Therefore, expanding spring hunting opportunities is likely to have less impact on the turkey population than expanding the fall either-sex season. Additionally, with the increased interest in pursuing spring gobblers, a growing turkey population, and minimal potential for impacts to the resource, timing is right to continue expanding spring turkey hunting opportunities.

Although the original spring hunting options report did not include options specific for youth, two of the four recent spring season expansions were youth-specific; introduction of a one-day youth-only season the Saturday prior to the regular season opener (began 2004), and introduction of the Mentored Youth Hunting Program, which includes spring turkey season (began 2006). The youth-only season has been very popular accounting for 7 – 8 percent of the total spring harvest (approximately 2,500 – 3,300 turkeys harvested by youth) each year. Some of this harvest may be additional, while other youth may have harvested turkeys during the regular season even without the youth season. The Mentored Youth Hunting Program also has been popular with an average spring gobbler harvest of 3,300 each year, comprising about 8% of the spring harvest.

Beginning 2008 the spring season was extended one day to include Memorial Day. This extra day accounted for 1-8 percent of the total harvests in each WMU, and 2 percent of the total statewide harvest, demonstrating that hunters are using the extra day even at the end of the season.

In 2006, after legislative approval, we began the sale of the special turkey license, providing hunters the option of harvesting a second spring turkey, above the one spring tag hunters receive with the general hunting license. From 2006 – 2009 sales of this license closed April 1st to allow time for processing and mailing the tag and report card to hunters. As of the 2009 - 2010 license year, hunters may purchase the license up to the day before the regular spring season opens, due to initiation of the Pennsylvania Automated Licensing System (PALS). On average, from 2006 – 2009, almost 4 percent of spring turkey hunters purchased the license, averaging 8,758 licenses each year, and an average harvest of 1,747, comprising about 4 – 5 percent of the spring harvest.

This report provides the biological aspects of six main options for spring turkey hunting so that informed decision-making can occur.

1. Change season dates
2. Extend hunting hours beyond the noon closure
3. Allow each hunter, with the purchase of the general hunting license, to choose between taking one bird in the fall and one in the spring, or two in the spring and none in the fall
4. Additional bird spring bag limit with purchase of general hunting license
5. Regulate turkey hunter numbers
6. Sunday Hunting

The authors recommend implementing one option at a time so its effects can be properly evaluated. Implementing more than one change confounds the effects and makes it difficult to determine the effect each management action has on the wild turkey resource. Current healthy turkey populations statewide, with existing population monitoring, assure that any negative affects could be corrected quickly with no long-term impacts.

1. Change season dates

- a. Open season earlier

Many hunters have suggested opening the spring season in mid-April. This issue is covered in the “Management Plan for Wild Turkeys in Pennsylvania, 2006-2015” (pages 21-23). The authors recommend against this option for the following biological reasons. Although many hens are bred by April 15th, the peak of incubation does not occur until about May 1 (incubation begins after a full clutch is laid). The average Pennsylvania statewide incubation initiation date from a ten-year study, 1953-63, was April 28. More recently, during a radio-telemetry study (1999-2001) in south-central Pennsylvania, the average incubation initiation date for adult hens was May 8, and May 13 for juvenile hens. Juvenile hens often breed later than adults.

Our spring season is timed to begin around the average peak of incubation, the Saturday closest to May 1. Until recently, when the end of the season would overlap with the week of Memorial Day, the season opened one week earlier. Opening the season earlier would create additional breeding and nesting disturbance, and illegal hen mortality. Research with radio-transmitted hens in Missouri, Virginia and West Virginia showed that hens in the egg-laying stage are more susceptible to nest abandonment and illegal spring harvest than hens that have begun incubating. In all three states, losses of hens during the spring gobbler season were greater when the season opened before the peak of incubation. Losses of hens to illegal harvest in those studies were 2.5 percent in West Virginia, 5.2 percent in Missouri and 6.0 percent in Virginia. Virginia’s higher hen mortality may be due to the season beginning prior to the peak of incubation in most years. In a current study in Ohio hen losses during the spring gobbler season have been in the range of 5.0 percent. If 5 percent in Pennsylvania are harvested, this translates to 1,935 hens killed. Interestingly, a study conducted from 1974-79 in north-central Pennsylvania showed an average hen loss of 22 percent during the spring season, but hen loss during a study in south-central Pennsylvania from 1999-2001 showed only 1 percent.

Beginning the season earlier in Pennsylvania may have substantial impact considering the large number of spring turkey hunters. Pennsylvania has more spring turkey hunters than most other states (230,000), with no regulation on hunting pressure. Therefore, our season structure remains conservative to protect the resource. In a recent study that reviewed data on nesting phenology in 34 states and Canadian provinces, researchers found that 25 opened spring hunting seasons more than two weeks prior to the mean date of incubation initiation, and 18 of those also allowed fall either-sex hunting. Pennsylvania's season typically opens 0-5 days prior to mean nest incubation initiation. The researchers concluded that harvest management with fall seasons and spring hunting during the pre-incubation period have the potential to negatively affect population dynamics, future harvests, and hunter satisfaction. Maintaining the current regular spring season opening date in Pennsylvania to coincide with the peak of turkey nest incubation minimizes the probability of accidental and illegal hen mortality, as well as nest abandonment of turkey hens that, any earlier, would be in the process of laying their clutch. The authors are in agreement with the Management Plan for Wild Turkeys in Pennsylvania, 2006 – 2015 that Pennsylvania's season is set to favor the resource rather than the hunter, particularly when the extent of benefits and harm are not well known.

Even when vegetation leafs out earlier than usual, the timing of wild turkey nesting does not vary noticeably. Nesting is more dependent on length of daylight hours than timing of spring green-up. Therefore opening spring gobbler season earlier may negatively impact nesting activity.

The peak of gobbling in Pennsylvania is not known. West Virginia's peak gobbling period is April 22 - May 1. Peak gobbling in northern New Jersey occurs May 1 - 12 in most years. If gobbling peaks before the spring season opens in Pennsylvania, hunter success could be improved, in some years, by moving the start earlier. However, a recent study in Iowa found that hunting activity suppresses gobbling. No matter when the season begins, gobbling activity will decrease when hunters enter the woods.

With the current season structure, the early opening date for the 2009 spring gobbler season was due to the timing of Memorial Day (Table 2). When the season first began in 1968, opening day was May 6. So the current season actually opens earlier than in the past. During the three-year period, 1988-1990, the season opened earlier with the earliest opening day April 21 (1990).

Like many eastern states, Pennsylvania experienced record breeding seasons from 1999-2002. These consecutive record hatches helped establish an older age structure resulting in an abundance of older gobblers in the population. Some turkey biologists hypothesize that the dominant older males suppress the gobbling of the younger males, with the net effect being less gobbling heard. In addition, following such good hatches hen numbers are higher than average. Therefore, with higher turkey populations, more spring turkey hunters in the field, and more hens to contend with, today's gobbler may be more difficult for hunters to call in.

Since 2004, the youth spring gobbler season now occurs the Saturday before the regular season opens. This timing limits potential for starting the regular season earlier. The youth season is designed to increase hunter recruitment and retention. Missouri, for example reports a very positive experience with their youth gobbler hunt showing an increase in youth license sales, and adult hunters are very supportive. The opportunity to take a youth hunting a week before the

regular season provides excellent scouting and calling benefits for adults, and can provide an unforgettable experience for youth and adults alike. Our youth season opens prior to the peak of nest incubation. However, the youth harvest typically comprises 7 - 8 percent of the total harvest. Therefore, this small harvest has minimal effect on reproduction.

Important points that a recent West Virginia study made are: regardless of the timing of the spring season, spring harvests are dependent on production two years prior to the season; the majority of the harvest is usually two-year old gobblers; and there is little carryover of two-year old gobblers. Our recently completed gobbler harvest and annual survival rate study also showed that hunters selected adult gobblers over jakes. Because spring reproduction is dependent on spring weather and we cannot control the weather, we have maintained a conservative approach to the spring season opener assuring the least possible impact on breeding and nesting activities.

According to the 2008 Pennsylvania Turkey Hunter Survey, 54 percent of hunters were in favor of an earlier season, 26 percent disagreed and 20 percent were undecided. When asked if the spring turkey season should start on May 1st each year (if Sunday then May 2nd), 42 percent agreed, 27 percent disagreed and 31 percent were undecided.

b. Lengthen the season

Our current spring season is four weeks with five Saturdays, ending Memorial Day. Increasing season length would result in greater recreational opportunity because after the drop in harvest following the first week the harvest remains relatively constant for the remaining three weeks. With the average 17 percent hunter success rate, additional days most likely would be utilized. Harvests on Memorial Day during 2008 and 2009 comprised 2 percent of the season harvest. This additional day simply provided more hunting opportunity because total number of days hunted throughout the season did not increase. Hunters simply used Memorial Day instead of another day. Adding days following Memorial Day would result in less hen mortality than adding days prior to the current opener, and is the recommended method for this option. Adding five additional days may increase the harvest by 10 percent, or 3,900 gobblers.

Results from the 2008 Pennsylvania Turkey Hunter Survey show that only 25 percent of the respondents believe the spring season is too short; 55 percent responded the season is not too short and 20 percent were undecided. When asked if the spring season should be extended to May 31, 48 percent of respondents agreed, 22 percent disagreed and 30 percent were undecided, suggesting that the majority of hunters are satisfied with the season length, but if given the opportunity to extend the season, a large percentage of hunters would like such an opportunity.

Season lengths in surrounding states are: Delaware (3 weeks), Ohio and West Virginia (4 weeks), Maryland, New Jersey and Virginia (5 weeks) and New York (the entire month of May). Of these states, New York's season runs through the Memorial Day weekend, as do most of the New England states (Maine, New Hampshire, Vermont, Rhode Island and Connecticut), and the province of Ontario.

c. Open the season during the week, not on a Saturday

Opening days in surrounding states are: Saturday - Virginia; Monday – Delaware, New Jersey, Ohio, West Virginia. Maryland begins on April 18, and New York begins on May 1. With our youth turkey hunt the Saturday prior to the regular season, Pennsylvania could potentially open the regular spring season during the week after the youth hunt. However, the same biological concerns occur with this option as with option 1a. On average, after opening day, 24 percent of the harvest, approximately 9,500 birds, are taken during the first week, Monday – Friday. This could result in substantial hen disturbance prior to peak nesting, and is not recommended. An alternative is to open the season on the same date each year, such as May 1, as New York does. If May 1 is a Sunday, then the season would open May 2. When asked this question on the 2008 Pennsylvania Turkey Hunter Survey, 42 percent agreed, 27 percent disagreed and 31 percent were undecided.

A Monday opener, as is done in four surrounding states, is another option, albeit, less popular with Pennsylvania hunters. Only 25 percent of survey respondents agreed with this option, whereas 57 percent disagreed and 18 percent were undecided. Additionally, as with the above option the authors recommend against opening the season during the week between the youth season and the current Saturday opener of the regular season.

d. Split the opening date – open season in southern PA one week earlier than northern PA.

Turkey hunters in Pennsylvania, Virginia and Ohio, where differences in latitude and altitude influence leaf out, have suggested this option. Florida and South Carolina currently have split opening dates for spring gobbler seasons. New Jersey had split opening dates with a four-week season for two years but abandoned the format for a longer season with an earlier statewide opening date. There are administrative and law enforcement concerns associated with this option because of the multiple opening days. Hunting pressure increases associated with an earlier opener in one part of the state could cause declines in hunter satisfaction, especially on public land.

Pennsylvania's biological data from South Mountain in south-central Pennsylvania showed later nesting (May 8 for adults) than the statewide average (April 28), and, therefore, does not support an earlier season in southern WMUs. Data from a study of nesting success in southern New Jersey indicated that incubation dates there were similar to those reported for Pennsylvania. West Virginia determined there was only a three-day difference in incubation dates between southern and northern WV.

2. Extend hunting hours beyond the noon closure.

a. Extend hours for the entire season

When the spring gobbler season first began in 1968, hunting hours were set conservatively from one-half hour before sunrise to 10:00 A.M. to reduce harvest, and breeding and nest disturbance. In 1973 hours were extended to 11:00 A.M. Since 1990, hours have been until 12:00 P.M., with a recommendation that hunters be out of the woods by 1:00 P.M.

Sunset during the spring season ranges from approximately 7:52 P.M. in eastern Pennsylvania on opening day, to approximately 8:18 P.M. during the last week of the season. Hunting hours end later for each meridian west so hunting hours in western Pennsylvania end 20 minutes later. Closing the season one-half after sunset would provide approximately 8.5 additional hours of turkey hunting for most hunters. Closing the hours at or prior to sunset could potentially minimize shooting turkeys on the roost. Roost shooting currently is not illegal but does raise ethical concerns. The issue also could be addressed by regulation changes. A survey conducted in 2003 indicated that only thirteen states had regulations expressly prohibiting the shooting of roosting wild turkeys. Thirty-six states have no formal prohibition on roost shooting, though regulations on shooting hours may provide the option for prosecuting this activity in those states. None of the states responding to the survey indicated a serious problem with roost shooting violations during either early morning or evening. Biological impacts of roost shooting appear minimal. Potential exists for additional hen mortality because positive identification of a bearded bird is difficult when turkeys are roosted. Closing hours prior to sunset raises law enforcement issues. For example, with this option a hunter who wants to roost a turkey for a morning hunt may be required to first leave the woods to deposit their gun before returning to roost a turkey.

Fifteen states currently conduct a morning spring turkey hunt ending at either noon or 1:00 PM while 34 other states (including Hawaii) and 3 Canadian provinces allow all-day spring hunting (Figure 1). Northeastern states have maintained more conservative spring hunting hours. Beginning 2004, Virginia initiated all-day hunting during the last two weeks of their five-week season. Ontario instituted an all-day spring season in 2004. Ohio will begin all-day hunting in the latter part of the spring season beginning 2010.

The main biological concern with extending hunting hours is additional disturbance of laying or incubating hens. Hunter surveys in Virginia showed that hens are flushed on approximately 1.0 - 1.5 percent of spring gobbler hunts. Biologists determined that increasing hunting hours would increase the number of hens flushed from nests and consequently increase nest abandonment. West Virginia reported higher flushing rates of hens when they lengthened their hunting hours from noon to 1:00 PM (increase in hens flushed from 7.8 percent to 11.2 percent of hunts). None of the six states responding to a recent survey reported having any data to substantiate increased disturbance of hens following the initiation of all-day hunting. However, intuitively one would expect that increased activity could have an impact on nesting activities to some degree.

Currently in Pennsylvania, turkey hunters spend on average, a total of 972,500 days afield during the half-day season. If 1.0 percent of these hunts result in a hen being flushed from her nest, then approximately 9,725 hens are flushed from nests. If hunting hours are extended, and effort increases 10 percent, then 11,200 flushing events could be expected. The difference is 1,475 additional nest disruptions. The fates of these nests that are disrupted are expected to vary depending on the date they are flushed. Early in incubation hens are likely to abandon the nest whereas hens that are flushed later in incubation are more likely to return to the nest. Overall, however, the net effect of the longer hunting hours is increased flushing and nest abandonment. The effects are likely to be local in nature, have less of an effect later in the season, and probably will not affect the statewide recruitment rate. Local effects likely are to be more significant on

public lands. If this option is adopted, impacts on the population can be monitored over time. If substantial impacts are detected, hunting hours could be adjusted accordingly.

Research in Kentucky and New Jersey showed that the greatest mortality factor affecting the male turkey population was their spring turkey season. The average harvest rate of adult males in Kentucky was 62 percent, higher than any other recorded in the literature, and that of juveniles was 23 percent. In New Jersey the average harvest rate of adult gobblers was near 50 percent, with juveniles being substantially lower. Survival of both juvenile and adult males during the rest of the year was greater than 80 percent in both states. Kentucky has a three-week spring season beginning in mid-April (two-bird season limit, one per day) with all-day hunting. During the study New Jersey had a six week spring season with a multiple bird bag limit and half-day hunting. Studies in other states (Missouri, Ohio and Wisconsin) have indicated that hunters typically take an average of 30 to 40 percent of the available gobblers during the spring hunting season in states with half-day hunting. The researchers in Kentucky concluded that further liberalization of the season would cause a decline in the quality of spring turkey hunting by affecting the age structure of the population. They also believe that high levels of adult male harvest are being sustained only because the population is still expanding rapidly after restoration. The lower vulnerability of juvenile males to being harvested and their high survival rate outside spring turkey season results in a high recruitment into the adult population. Gobbler harvest rates currently are being studied in Pennsylvania and preliminary harvest rates for adult gobblers are 38 percent and 22 percent for juvenile males. More information on specific gobbler harvest rates will be available when the analysis of data is complete later this winter.

A seventeen question survey was sent to wild turkey biologists in six states where spring hunting hours were expanded to include all-day hunting within the last ten years (Indiana, Kentucky, Michigan, Virginia and Wisconsin) and two states (South Dakota and Wyoming) where all-day spring hunting occurs with current radio telemetry studies on gobbler survival. Responses were received from six of the eight states.

None of the six states responding to the survey reported a substantial increase in the spring gobbler harvest associated with the regulation change. Rather, it was reported that increased harvest, where it occurred, was more likely the result of growing turkey populations. There was, however, some concern regarding changes to the age structure due to the increased take of adult gobblers under liberalized harvest regimes, possibly due to Kentucky's results. Implications of a younger age structure include a decrease in breeding success and decrease in hunter satisfaction. Indiana biologists reported an increase of two percent in the average proportion of adult gobblers in the harvest after initiating all-day hunting. This increase was determined to be insignificant in that state with a one gobbler spring bag limit. Pennsylvania currently allows the taking of a second gobbler by hunters who purchase a second gobbler license prior to the season. A two percent increase in adult harvest rate in Pennsylvania might not impact the age structure and hunter satisfaction, but is something to be considered in the discussion of all-day hunting.

Participation throughout the longer hunting hours tends to be variable. States responding to the recent survey reported afternoon participation rates ranging from twenty to forty percent of spring hunters. The addition of afternoon hours could increase participation by adult hunters who work mornings and by younger hunters able to take to the woods after school. Indiana reported a

noticeably higher rate of participation among youth turkey hunters in the first year of all-day hunting compared to participation rates in the five years prior to its initiation. Only one state reported increased numbers of turkey hunters following regulation changes allowing additional hunting hours. Biologists in Michigan noted that this increase in hunter numbers might be the result of growing turkey populations rather than increased availability of hunting hours.

States with all-day spring hunting estimate the following percentage of harvest occurs in the afternoon:

Alabama, Georgia, and Tennessee 10%;

Kentucky 10-15%;

Texas 14%;

North Carolina 16% of the shots at gobblers were taken during the afternoon;

Iowa 15-25%;

South Carolina 25%;

Michigan 20%;

Virginia 5-10%;

Indiana 21%;

Wyoming 15-20%

The extent to which these percentages are additive to morning harvest is largely unknown. It is likely that some birds that were killed in the afternoon would have been killed later in the season, in the morning. Based on harvest patterns in other states, an additional 10 - 15 percent harvest can be expected from afternoon hunting. Any concern regarding a greater proportion of the harvest being taken earlier in the season in states allowing all-day hunting appears to be unfounded. Biologists in Indiana reported that the daily distribution of the harvest throughout the season was unchanged after initiating all-day hunting in that state. The bulk of the harvest continued to take place in the morning. None of the respondents to the recent survey reported any issues with the daily distribution of the harvest throughout the season.

Hunter success is lower during the afternoon than the morning. Additional harvest during the afternoon in Pennsylvania should not exceed that experienced in all-day spring hunting states. The authors believe that additional spring male mortality of up to 10 percent would not have substantial detrimental impacts to turkey populations. According to current harvest figures, an additional 3,950 gobblers might be harvested, increasing the spring harvest to approximately 45,700. However, the additional harvest would vary by Wildlife Management Unit. Therefore, impacts would vary across the state.

Some biologists feel that all-day spring hunting is popular with hunters who work mornings or prefer not to rise early. To the degree that extended hunting hours staggers participation through the day, turkey hunting safety and interference with other hunters might be improved slightly.

According to results of the 2008 Pennsylvania Turkey Hunter Survey, support for extended spring hunting hours is evenly divided; 43 percent of the respondents agreed spring turkey season should be from one-half hour before sunrise to one-half hour after sunset, 43 percent disagreed, and 14 percent were undecided. Support may be limited because Game Commission educational efforts historically have stressed the importance of hunters leaving the woods by 1

P.M. to minimize disturbance of nesting hens. Although states with all-day spring hunting have not shown substantial nest disturbance, Pennsylvania is unique with more spring turkey hunters (approximately 230,000) than most states. Acceptance may be greater if the agency develops this change on an experimental basis for three to five years, during which time population fluctuations can be monitored via harvest and summer turkey sighting survey data.

Among the social concerns are the potential for increased trespass and other violations associated with additional hunting hours. Informal contacts with wildlife agency law enforcement officials in states open for all-day spring hunting produced a general consensus that violations associated with afternoon hunting were mostly of the nature related to hunters abandoning the woods and utilizing road hunting techniques in the afternoons to locate feeding birds. Types of violations typically linked to road hunting are shooting from roadways, flock shooting of birds in fields, loaded firearms in vehicles and use of illegal firearms, i.e., rifles to shoot turkeys in fields at greater distances. The illegal firearm use could have potential for an increase in hunting related shooting incidents. Some increase in the incidental killing of hens in the spring season could result from road hunting. Some concern was also expressed about the potential for roost shooting late in the day.

Although concern for some level of illegal activity was expressed by all of the officials contacted we were not able to obtain detailed prosecution statistics on the percentage of increase in illegal activity because most state agency data bases do not currently track violations by the time of day and they indicated hand searches of records were too labor intensive.

None of the states responding to the recent survey reported a documented increase in road hunting violations, roost shooting reports, illegal take of hens, attempts to take gobblers over the legal bag limit or other violations. Wyoming biologists reported no illegal take of gobblers associated with afternoon hunting among radio-marked birds. Despite these responses, some increase in illegal activity should be expected to accompany any expansion of hunting opportunity. Such increases generally are not thought to have potential to adversely impact populations on a WMU level.

Nonbiological benefits of extended spring turkey hunting hours include; 1) increased opportunities for all hunters; 2) youth hunters could hunt after school; 3) adult hunters could hunt after work, and with their children during the week; 4) additional hunter participation and possibly retention, from both resident and non-resident hunters; 5) the bag limit would not change, but hunter success rates may improve from the current 17 percent average success rate, and 6) staggering participation throughout the day may decrease hunter interference and improve hunter safety.

b. Extend hours for the last one or two weeks of the season

Since 2004 Virginia has allowed all-day hunting during the last two weeks of their five-week spring season. Virginia officials decided on this option rather than all-day hunting for the entire season because of concerns with their already high mortality rates of gobblers and illegal hen harvest. Because Virginia's season begins earlier than Pennsylvania's and typically opens prior to the peak of nest incubation, their biologists speculate that all-day hunting early in the season

could substantially interfere with breeding. In addition, the early season opener attracts large numbers of hunters from other states resulting in heavy pressure on public lands. This compromise option was selected to minimize such impacts. Most of the traditional turkey hunting pressure will have already occurred, but this option does increase hunting opportunities for those unsuccessful during the first part of the season. Mississippi, an all-day hunting state, reported that public land had more afternoon harvest than private lands. It was also reported that afternoon hunting pressure might suppress gobbling activity on public land earlier than on private land. This option will minimize that impact to public land.

Gobbler harvest rates in Pennsylvania are at the high end for states with an established turkey population (i.e., no longer being restored). This option is more biologically conservative than (a) and is a good first alternative to (a) with possible expansion after initial (3 – 5 year) assessments are made. The authors recommend this option if all-day hunting is initiated.

3. Allow each hunter, with the purchase of the general hunting license, to choose between taking one bird in the fall and one in the spring, or two in the spring and none in the fall.

For fall turkey hunters who do not harvest a turkey, or for hunters who decide not to hunt fall turkey, this option provides increased spring turkey hunting opportunities without the need to purchase the special turkey license to harvest a second spring bird. However, now that we have the special spring license this option is not as beneficial for the agency or hunters. This option is still possible, and simply provides hunters with more possibilities. This option might be more popular in the future if we change to a fee-based turkey hunting license.

This management strategy places more emphasis on spring turkey hunting than fall hunting. Spring turkey hunting poses less of a risk of overharvest than the either-sex fall turkey season. Over time hunter emphasis on spring hunting has become more pronounced. For the last nine years hunter participation has been higher during spring than fall (approximately 229,000 spring hunters versus 207,000 fall). Four states have hunter options: Alabama, Maryland, Massachusetts, and Virginia. Maryland and Virginia have had a decrease in fall hunter participation and harvest, some of which can be attributed to this option. Maryland is considering cancelling this option and simply increasing their spring bag limit due to the decrease in fall season participation.

Another down-side to this option is the potential for an increase in spring season hunting pressure. However, with the current 17 percent average spring hunter success rate, this increased pressure would not be significant because not all successful spring hunters will either have a second tag, or have interest in pursuing a second spring turkey.

Spring harvests would increase under this option, but not significantly. During the last ten years spring harvests have averaged 39,500 birds, not including harvests from the special spring license. Of these successful hunters, only one-quarter to one-third (9,900 – 13,000) would be expected to have a tag remaining from the previous fall and pursue an additional spring turkey (based on data from New York and Virginia). Using figures from the special turkey licenses, which have averaged 20 percent of license holders harvest a second spring turkey, the harvest would increase by approximately 2,300 to approximately 41,800. This increased harvest would

be offset slightly by a decrease in the previous fall season harvest, decreasing potential impacts to the population.

There is potential for increased hunter interference, which may lead to decreased hunter satisfaction, and possibly more hunting-related shooting incidents. These factors could be monitored with changes made if problems arise.

Although this option does not increase turkey-hunting opportunities for all turkey hunters, it is expected to have minimal impact on the wild turkey resource. Even though there may be more hunters pursuing turkeys throughout the spring season, disturbance to hens will continue to be limited to the morning when most incubating hens are on the nest and less susceptible to disturbance or accidental harvest, so hen mortality should remain low.

A simple licensing change for implementing the hunter choice option would be to make the fall turkey tag an either season tag.

Responses from the 2008 Turkey Hunter Survey were mixed. Forty-five percent of the respondents disagreed with this option, 36 percent agreed, and 18 percent were undecided. However, this option does not increase the annual bag limit. Successful spring hunters who opt for a second (or third) spring turkey would have given up their opportunity in the fall. These successful hunters often would be successful regardless of the season.

This option rewards only successful turkey hunters rather than increasing opportunity for all spring hunters.

4. Two-bird spring bag limit with the purchase of the general hunting license.

a. Anytime during the season

This option would increase the annual bag limit. However, now that we have the special spring license this option is not as beneficial for the agency or hunters. Thirty-two states plus the province of Ontario have spring bag limits of more than one bird (season limits of two to five, most commonly two), and 17 states have a one-bird spring limit (Alaska does not have a wild turkey season; Figure 1).

Some potential disadvantages of this option are a slight increase in breeding and nesting disturbance, additional illegal spring hen mortality, a possible decline in the percentage of adults in future spring harvests, and increased hunter interference. Additionally, it is assumed that more hunters would participate in this option than Option 3, the fall hunter option, because hunters would not be required to forgo harvesting a fall turkey to take two birds in the spring. Of the average 40,400 successful spring hunters, up to 30 percent would be expected to harvest a second bird (data from New York and Virginia), increasing the harvest by 12,100 to approximately 52,500 bearded birds, plus the harvest from the special spring license. This would result in an adult gobbler harvest rate approaching 50 percent, which is not advisable for hunter satisfaction. However, this option likely would not substantially harm existing turkey populations, since most of the breeding has been completed before the spring hunt and sufficient

polygamous males remain to mate with the remaining unbred hens. Also, hunting would be limited to the morning. These factors could be monitored with changes made if problems arise.

Current support for the special spring license is not strong. When asked, in the 2008 Turkey Hunter Survey, if turkey hunters support the taking of a second spring turkey with the purchase of a Special Turkey License 48 percent agreed, 37 percent disagreed and 15 percent were undecided. However, support likely would increase for a two-bird bag limit with the purchase of the general hunting license.

b. Additional bird during second half of season

Biological impacts of this option would be less than Option 4a because hunter pressure would be dispersed throughout the season. With the majority of the hen population incubating by this time, accidental hen mortality and nest abandonment would be low. Also, overall hunter pressure would be lower than Option 4a because some hunters would lose interest in hunting toward the end of the season.

When New York State instituted a second bird spring bag limit in 1982, they restricted harvesting the second bird until the second two weeks (but not two during the second half) to spread the harvest among hunters. In 1988 they changed to allow one bird anytime during the season and the second bird during the second two weeks. In 1991 it was determined that the size of the turkey population (250,000) and spring harvest levels (35,000-39,000) provided ample hunting opportunities throughout the season, and the season was opened to two birds throughout the season, one turkey per day. Current hunter success rates in New York (20-30 percent) are higher than Pennsylvania (17 percent). Although Pennsylvania's average spring turkey population is approximately 320,000 with spring harvests of 40,400 Pennsylvania has substantially more spring turkey hunters than New York, resulting in more nest disturbance and hunter interference, warranting a conservative approach to increasing the bag limit, similar to the approach by New York State.

If the daily limit during the second half of the season is increased to two birds, the total harvest with this option would be less than Option 4a because hunter success and hunter interest tend to wane as the season progresses. The additional harvest during the second half of the season also would have less impact on hens than during the first half of the season.

c. Additional tag for private land only

Biologically, this option would not place any additional hunting pressure or harvest on public lands, thereby would not impact gobbling activity or hen disturbance on public lands. Approximately 40 percent of Pennsylvania turkey hunters do most of their hunting on public-owned land. Connecticut, a state with a small percentage of public land, is the only state with this option.

d. Additional tag issued by issuing agent and/or regional office after first bird is reported.

This option might have the affect of improving reporting rates by providing an incentive to report. Spring reporting rates average around 19 percent, prior to initiation of PALS. Improving reporting rates is an important turkey management issue. With PALS in place, hunters might be able to report the harvest at the issuing agent while purchasing the next tag. This option also could provide an opportunity to collect additional biological data of harvested birds.

5. Regulate turkey hunter numbers

This option has more social than biological impacts. Biologically, this option could be used to decrease hunter pressure, gobbler harvest rates and hen mortality and disturbance in areas where these are too high. Hunter numbers could be regulated by WMU or on public land. Current harvests and hunter pressure do not appear to be limiting, especially during the spring season. Analysis of harvest by WMU from the special turkey licenses (2006-2009) show that hunters harvested from the same WMUs and selected adult gobblers over jakes at the same rates as first harvests.

Hunter support for this option is low. When asked, in the 2008 Turkey Hunter Survey, if the number of turkey hunters should be managed to increase safety and satisfaction of turkey hunters, only 16 percent agreed, 27 percent were undecided and 57 percent disagreed. When asked if fall season length should be the same in all WMUs (three weeks), and harvests should be managed by adjusting hunter numbers in each WMU, 20 percent agreed, 34 percent were undecided and 46 percent disagreed. This option may be useful in the future after other spring options are explored.

6. Allow Sunday hunting during the spring season

Sunday hunting is permitted in all surrounding states to some degree. Although there has been strong opposition to Sunday deer hunting, especially by the agricultural community, support for Sunday spring turkey hunting may be more palatable especially if the season closes at noon daily. This would give farmers and other users of state lands use of these areas during the afternoon hours without conflict with hunters. This option would be beneficial to all turkey hunters, providing five additional hunting days to all licensed hunters. It would increase opportunity for youth hunters who often participate in organized sports on Saturday, limiting their chances to hunt. In addition, those hunters required to work on Saturday would be given another option. This option could possibly increase license sales to individuals with limited time, as well as to nonresidents.

Biological implications would be low because a portion of the harvest would simply occur earlier, while additional harvest would be expected not to exceed 10 percent.

Support for this option was evenly divided in the 2008 Turkey Hunter Survey. When asked if Sunday turkey hunting should be legal, 46 percent agreed, 45 percent disagreed, and only 9 percent were undecided. Although Sunday spring turkey hunting would require legislative action, creation of the special turkey hunting license also required legislative action and was

successfully instituted. This type of Sunday hunting may be more acceptable to legislatures than Sunday deer hunting, especially given its increase in hunting opportunities.

Conclusion

From these options, the authors recommend allowing Sunday hunting if and when the legislature provides this authority to the Game Commission, extending hunting hours during the second half of the spring season, a two-bird spring bag limit during the second half of the season with the purchase of the general hunting license, or allowing a two-bird spring bag limit with the purchase of the general hunting license if the hunter forgoes a fall turkey (Table 1). These options increase hunting opportunities while posing minimal biological concerns.

The wild turkey population management goal is to maintain and enhance wild turkey populations in all suitable habitats throughout Pennsylvania for hunting and viewing recreation by current and future generations. The Pennsylvania Game Commission has the same philosophy as Pennsylvania's sportsmen/women; as turkey populations grow so should hunting opportunities. Whether it is by providing additional days such as Sunday hunting, extending spring hunting hours during the second half of the season, increasing the spring bag limit, or giving the hunter the choice of taking one turkey in each season or two bearded birds in the spring, these options could possibly increase hunting opportunities without adversely impacting turkey populations. Population growth rates would likely decline with increased harvest and reduced reproduction. The magnitude of the decline in growth rates is unknown, and may not be significant. Effects of any option would be monitored over a period of three to five years for changes in trends. The authors recommend that only one regulation change be incorporated at a time and that a three year period be maintained before any additional changes are suggested in order to properly evaluate the impact of a given change.

Table 1. Summary of Spring Turkey Hunting Options¹

	Adverse Biological Impact	Increased Hunting Opportunity	Additional Retention/ Recruitment Value	Increased Hunting Pressure/ Interference
1a. Open Earlier	High	Low	Low	None
1b. Lengthen Season	Low	Medium	Low	None
1c. Open on Weekday	None	Decrease	None	None
1d. Different Opening Day in Different Areas	None	Medium	Low	Increase - on opening days
2a. Extend Hours throughout Season	Medium	High	High	Reduce
2b. Extend Hours - Second Half of Season	Low	High	Medium	Reduce
3. Two bird Spring – Hunter forgoes Fall bird	Low	Medium	Low	Medium - spring
4a. Two bird Spring Limit (General hunting license)	Medium	Medium	High	High
4b. Two bird Spring Limit – Second Half of Season	Low	Low	Medium	Medium
4c. Two bird Spring Limit – Private Land Only	Low	Low	Medium	Medium
4d. Two bird Spring Limit – Second Tag Issued After Reporting Harvest	Low	Low	Medium	Medium
5. Regulate Hunter Numbers	None	Decrease	None	Reduce
6. Sunday Turkey Hunting	Low	Medium	Medium	None

¹ Implementing one change at a time will allow proper evaluation of effects.

Table 2. Pennsylvania spring gobbler season dates. **Bold = years** when the spring season began earlier than at present.

Year	Dates	Length	Year	Dates	Length
1968	May 6 - 11	6 days	1990	Apr 21 - May 19	4 wks
1969	May 3 - 10	1 wk	1991	Apr 27 - May 25	4wks
1970	May 9 - 16	1 wk	1992	May 2 - May 30	4wks
1971	May 8 - 15	1 wk	1993	May 1 - May 29	4wks
1972	May 6 - 20	2 wks	1994	Apr 30 - May 28	4wks
1973	May 5 - 19	2 wks	1995	Apr 29 - May 27	4wks
1974	May 4 - 18	2 wks	1996	Apr 29 - May 25	4wks
1975	May 3 - 24	3 wks	1997	May 3 - May 31	4wks
1976	May 1 - 22	3 wks	1998	May 2 - May 30	4wks
1977	Apr 30 - May 21	3 wks	1999	May 1 - May 29	4wks
1978	Apr 29 - May 20	3 wks	2000	Apr 29 - May 2	4wks
1979	Apr 28 - May 19	3 wks	2001	Apr 28 - May 26	4wks
1980	Apr 26 - May 17	3 wks	2002	Apr 27 - May 25	4wks
1981	May 2 - May 23	3 wks	2003	Apr 26 - May 24	4wks
1982	May 1 - 22	3 wks	2004	May 1 - May 29	4wks
1983	Apr 30 - May 21	3 wks	2005	Apr 30 - May 28	4wks
1984	Apr 28 - May 19	3 wks	2006	Apr 29 - May 27	4wks
1985	Apr 27 - May 25	4 wks	2007	Apr 28 - May 26	4wks
1986	Apr 26 - May 24	4 wks	2008	Apr 26 - May 26	4wks
1987	Apr 25 - May 23	4 wks	2009	Apr 25 - May 25	4wks
1988	Apr 23 - May 21	4 wks	2010	May 1 - May 31	4wks
1989	Apr 22 - May 20	4 wks			

1985 - 2007: Pennsylvania's spring gobbler season was 4 weeks long including 5 Saturdays, ending the Saturday of Memorial Day weekend.

2008 - Present: Spring gobbler season ends on Memorial Day.

Beginning 2004; youth spring gobbler season the Saturday prior to regular season.

Figure 1. Closing Hours for Spring Turkey Hunting

